What is claimed is:

1. A three-dimensional model selected from the group consisting of: (a) a three-dimensional model of a complex between (i) an extracellular domain of a human high affinity Fc epsilon receptor alpha chain (FcεRIα) protein and (ii) a human IgE Fc region comprising Cε3 and Cε4 domains (Fc-Cε3/Cε4), wherein said model substantially represents the atomic coordinates specified in Table 1; and (b) a three-dimensional model comprising a modification of said model of (a), wherein said modification represents a complex between a Fc receptor protein that binds to a Fc domain of an antibody and an antibody Fc region that binds to a Fc receptor protein.the hinge between domain Cε3 and domain Cε4 of the Fc-Cε3/Cε4 region, and a FcεRIα:Fc-Cε3/Cε4 region that interacts with 3-[3-(cholamidopropyl) dimethylammonio]-1-propane-sulfonate (CHAPS).

2. A method to produce the three-dimensional model of claim 1, wherein the three-dimensional model is the complex between the extracellular domain of a human FcεRIα protein and a human Fc-Cε3/Cε4 region, said method comprising representing amino acids of said protein and said region in said complex at substantially the atomic coordinates specified in Table 1.

3. A method to produce the three-dimensional model of a complex between (i) an extracellular antibody binding domain of an antibody receptor protein other than human FcεRIα as represented by coordinates in Table 1 and (ii) an antibody receptor binding domain of an antibody other than human IgE as represented by coordinates in Table 1, said method comprising homology modeling.

4. An isolated crystal of a complex between an extracellular domain of a FcεRIα protein and an IgE Fc-Cε3/Cε4 region.

5. A method to produce the isolated crystal of claim 4, wherein the complex is between an extracellular domain of a FcεRIα protein and an IgE Fc-Cε3/Cε4 region, said method comprising vapor diffusion.

6. A method to identify a compound that inhibits the binding between an IgE antibody and a FcεRIα protein, said method comprising using a three-dimensional model of a complex between an extracellular domain of a human high affinity FcεRIα protein and a human Fc-Cε3/Cε4 region to identify said compound, wherein said model substantially represents the atomic coordinates specified in Table1.

7. An inhibitory compound identified in accordance with the method of Claim 6.

8. A therapeutic composition comprising an inhibitory compound of Claim 7.

9. A method to protect an animal from allergy, said method comprising administering to said animal an inhibitory compound of Claim 7.

10. A compound that inhibits the binding between an IgE antibody and a FcεRIα protein, said compound identified by analysis of a three-dimensional model of a complex between an extracellular domain of a human high affinity FcεRIα protein and a human Fc-Cε3/Cε4 region to identify said compound, wherein said model substantially represents the atomic coordinates specified in Table 1.

11. A polypeptide selected from the group consisting of a FcεRIα:Fc-Cε3/Cε4 interaction site 1, a FcεRIα:Fc-Cε3/Cε4 interaction site 2, a C strand of domain 2 of FcεRIα, a C'E loop of domain 2 of FcεRIα, a tryptophan-containing hydrophobic ridge of FcεRIα, a crystal contact cluster involved in IgE binding; a FG loop in D2; a D1D2 interface; a cleft between D1 and D2; a domain 1; a domain 2; a hydrophobic core; a A'B loop of D1; a EF loop of D1; a BC loop of D2; a CC' loop of D2; and a strand of D2.

12. An isolated nucleic acid molecule encoding the polypeptide of Claim 11.

13. A method of using the three-dimensional model of claim 1, comprising:

(a) analyzing the three-dimensional model substantially representing the atomic coordinates specified in Table 1 to identify at least one amino acid of a target protein represented by said three-dimensional model which if replaced by said identified amino acid(s) to improve a function of said target protein; and

(b) replacing said identified amino acid(s) to produce a mutein having at least one of said improved function.

14. The method of claim 13, wherein said target protein is a Fc-Cε3/Cε4 protein, a FcεRIα protein or a protein comprising SEQ.ID NO.2, and wherein said improved function is selected from the group comprising: (a) increased stability, increased affinity for an IgE binding domain of a FcεRIα protein, altered substrate specificity or increased solubility when said target protein is the Fc-Cε3/Cε4 protein; and (b) increased stability, increased affinity for an Fc-domain of an antibody, altered substrate specificity or increased stability when said target protein is the FcεRIα protein or the protein comprising SEQ.ID NO.2.

15. A mutein produced by the method of claim 14, wherein said mutein has at least one improved function compared to the target protein, wherein said target protein is the FcεRIα protein, the Fc-Cε3/Cε4 protein or the protein comprising SEQ.ID NO.2.

16. The mutein of claim 15 having an improved function compared to an unmodified FcεRIα protein, wherein the amino acid sequence of said mutein differs in at least one position from the amino acid sequence of said unmodified protein, said position being in a region selected from the group consisting of a crystal contact cluster, a tryptophan-containing hydrophobic ridge, a FG loop in D2, a D1D2 interface, a cleft between D1 and D2, a domain 1, a domain 2, a hydrophobic core, a A'B loop of D1, a EF loop of D1, a BC loop of D2, a C strand of D2, a CC' loop of D2, a C'E loop of D2, a strand of D2, the amino terminal five residues of said protein, and the carboxyl terminal five residues of said protein.

17. An isolated nucleic acid sequence encoding a mutein of Claim 15.

18. A recombinant virus comprising said nucleic acid sequence of Claim 17.

19. A recombinant cell comprising said nucleic acid sequence of Claim 17, wherein said cell is capable of expressing said nucleic acid sequence.

20. A diagnostic reagent comprising a mutein of Claim 15.

21. A therapeutic composition comprising a mutein of Claim 15.

22. A method to use a mutein of Claim 15, wherein said method is selected from the group consisting of: (a) a method to protect an animal from allergy, said method comprising administering a therapeutic composition comprising said mutein to said animal; (b) a method to detect allergy, or susceptibility thereto, in an animal, said method

comprising using said mutein to detect said allergy; and (c) a method to enhance the performance of an IgE binding assay, said method comprising incorporating into said assay said mutein.